

I claim:

1. A continuous feed injection unit, comprising:
  - a first hydraulic motor;
  - a second hydraulic motor;
  - cooperating continuous well string gripping chains connected to be driven by the first and second hydraulic motors;
  - a hydraulic power supply connected to provide pressurized fluid to the first and second hydraulic motors;
  - a control system for the hydraulic power supply; and
  - the control system for the hydraulic power supply having a motor speed control valve with at least a first and second operating configuration, the first operating configuration providing power fluid to the first and second hydraulic motors in parallel and the second operating configuration providing power fluid to the first and second hydraulic motors in series.
2. The continuous feed injection unit of claim 1 in which the control system for the hydraulic power supply incorporates a motor direction control valve through which the power fluid flows, the motor direction control valve been configured to reverse flow of power fluid through the first and second hydraulic motors.
3. The continuous feed injection unit of claim 1 in which the continuous chains comprise a first continuous chain and a second continuous chain, the first continuous chain being driven by the first hydraulic motor and the second continuous chain being driven by the second hydraulic motor.
4. A service rig, comprising:
  - a mast;
  - a hydraulic power supply for the power tongs provided adjacent the mast;

a first hydraulic motor mounted on the mast;  
 a return for hydraulic fluid used by the first hydraulic motor;  
 cooperating continuous well string gripping chains connected to be driven by the first hydraulic motor;

the hydraulic power supply for the power tongs being connected to provide pressurized fluid to the first hydraulic motor;

a control system for the hydraulic power supply; and

the control system for the hydraulic power supply having a motor direction control valve with at least a first, second and third operating configuration, the first operating configuration providing power fluid to the first hydraulic motor to lift well string from the well, the second operating configuration providing power fluid to the first hydraulic motor to inject well string into the well and the third operating configuration allowing power fluid to flow from the hydraulic power supply directly to the return.

5. The service rig of claim 4 further comprising a second hydraulic motor, the second hydraulic motor being powered by the hydraulic fluid power supply and cooperating with the first hydraulic motor under control of the control system to drive the continuous well string gripper chains.

6. The service rig of claim 5 further in which the control system further comprises a motor speed control valve with at least a first and second operating configuration, the first operating configuration of the motor speed control valve providing power fluid to the first and second hydraulic motors in parallel and the second operating configuration of the motor speed control valve providing power fluid to the first and second hydraulic motors in series.

7. The service rig of claim 5 in which the continuous well string gripping chains comprise a first continuous chain and a second continuous chain, the first continuous chain being driven by the first hydraulic motor and the second continuous chain being driven by the second hydraulic motor.

PDF GENERATED BY

8. A method of pulling well string from a well penetrating a heavy oil reservoir, the method comprising the steps of:

pulling well string through heavy oil using at least two motors in parallel; and

when the well string is free of the heavy oil, pulling the well string using the two motors in series to pull the well string more rapidly from the well than the well string was pulled through the heavy oil.

9. The method of claim 8 in which the two motors are powered by a power tong hydraulic power supply of a service rig.

2004-09-09 14:29:00